June 2021 Report to StudyPerth

Economic Contribution of International Students to Western Australia



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Suggested citation for this report

ACIL Allen (2021), Economic Contribution of International Education in Western Australia, Report commissioned by StudyPerth

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Executive summary

The strategic and economic context

The growth and development of Western Australia's international education sector is a priority economic development objective for the McGowan Government since coming to power in 2017. This was acknowledged through the international education sector's identification as one of six priority sectors in the WA Government's, economic development framework, *Diversify WA*. Diversify WA highlights international education as one of six priority sectors based on the clear opportunity for WA to grow its international presence and brand as an education destination, underpinned by increasing urbanisation and a growing number of consumers in key source markets seeking a quality education alongside a healthy and vibrant lifestyle.

In 2020, StudyPerth commissioned ACIL Allen to quantify the economic importance of international education to the WA economy. ACIL Allen estimated that in 2019, the 53,404 international student enrolments in Western Australia boosted the State's Gross State Product by \$2.1 billion and supported almost 12,000 direct and indirect FTE jobs across Western Australia.

Since the completion of this study in April 2020, the international education sector has been hit hard by the COVID-19 pandemic, as governments around the world close their borders to the movement of people to protect the health and wellbeing of their citizens.

The COVID-19 pandemic and associated travel restrictions had a severe impact on the arrival of international students in Western Australia in 2020. This has continued into 2021, with a timeline on the return of international students to Western Australia remaining unclear. The rollout of the vaccination program in WA and overseas, as well as the return of Australian citizens who have expressed a desire to come back to WA, have been identified as two critical factors that will determine when international students can resume travel to WA. The opening of a travel bubble between Australia and New Zealand has provided the platform for the re-commencement of international travel, with the next stage a possible extension of travel bubbles to additional countries such as Singapore.

While higher education institutions have managed to adjust to the COVID-19 pandemic through the delivery of online learning, not all education sub-sectors are adequately resourced to undertake this transition. In addition, not all education sub-sectors are conducive to the delivery of course material online and there is a growing desire from many international students for a return to face-to-face learning.

As the number of international students in Western Australia continues to fall as a result of the travel restrictions, labour and skill shortages in the State are at risk of becoming more severe. International students are active participants in the WA labour force, as well as in their local community through volunteer roles. As with many West Australians, international students in the state were impacted by the job losses resulting from the lockdown measures in the first half of

2020. In the 2021-22 Federal Budget, the Government announced support to employers in the tourism and hospitality sectors to help them find workers, by temporarily allowing student visa holders to work more than 40 hours per fortnight, as long as they are employed in the tourism or hospitality sectors. This measure builds off previous changes announced in response to COVID-19 which allowed international students working in critical sectors, such as agriculture, health and aged care, to work more than the previous cap of 40 hours per fortnight.

Given the significant financial and economic impacts that have resulted from COVID-19 and the associated travel restrictions on the international education sector, and the importance placed on the sector as part of the WA Government's economic development agenda, it is critical that governments continue to look at ways in which it can support the recovery of the sector and direct it towards a sustainable pathway going forward.

In order to understand the overall impact of the COVID-19 pandemic on the international education sector, ACIL Allen was engaged by StudyPerth to provide an update on the economic contribution of the international students to the WA economy in the 2020 calendar year, to compare to the prepandemic year in 2019. ACIL Allen was also asked to model the contribution of international students on the WA economy based on an assumed path back to pre-COVID-19 student numbers in Western Australia.

In estimating the economic contribution of international student expenditure, ACIL Allen has produced results by education sub-sector (Higher Education, VET, Schools, ELICOS and Non-award) and by key source market in terms of the direct and indirect impact of international student expenditure on:

- Gross State Product (GSP), which is the broadest measure of economic activity, to understand how international student and VFR expenditure flows through the economy; and
- Employment, in Full Time Equivalent (FTE) terms, to understand how international student expenditure translates to higher jobs across the economy.

However, the impact of declining student numbers studying in Western Australia over the next few years extends beyond the reduced levels of spending in the economy. International students are also a valuable source of labour for a number of industries, including in hospitality, retail, administrative support and education and training. The reduced supply of labour to these sectors has economic consequences to Western Australia, particularly in the current environment where labour shortages are becoming more pronounced.

To estimate the economy-wide impacts of the labour market constraints created by the continued border closures on international students studying and working in Western Australia, ACIL Allen applied this constraint to its computable general equilibrium model, *Tasman Global*, with results presented in terms of the loss to WA's Gross State Product from Semester 1 2021 through to Semester 1 2023.

Trends in International Education in Western Australia

International Education by Education Sub-sector

In 2020, there were 49,681 international student enrolments in WA education and training institutions, a decline of 6.5 per cent on the previous year, making it the first year since 2014 that WA recorded total international student enrolments below 50,000. By education sub-sector, higher education accounted for 48 per cent of total enrolments, while VET accounted for 33 per cent. Of the remaining sub-sectors, ELICOS accounted for 14 per cent of total enrolments, followed by schools (1.5 per cent) and non-award (2.8 per cent).



Figure ES 1 Western Australia International Student Enrolments by Education Sub-Sector, 2005-2020

International Education by Source Market

WA attracts international students from a diverse range of source markets. In 2020, there were international students enrolled at WA education institutions from a total 145 source markets. The five largest source markets for international students in Western Australia captured 46 per cent of total international student enrolments in 2020, while the ten largest source markets captured 64 per cent.

In 2020, Western Australia's two largest source markets for international students were again India (18.4 per cent) and China (14.3 per cent). The next three largest source markets for Western Australia in 2020 were Malaysia (5 per cent), Bhutan (4.6 per cent) and Nepal (4.2 per cent).



Figure ES 2 Western Australia International Student Enrolments – Ten largest source markets for total enrolments, 2020

COVID-19 and the International Education Sector

As a result of the COVID-19 pandemic, international travel restrictions were progressively introduced in early 2020. This commenced with the cessation of direct travel from China from 1 February 2020, followed by further staged restrictions until all foreign entry was ceased on 20 March 2020.

The growth in enrolled international students outside Australia completing studies online is moderating the impact of ongoing declines of enrolled international students in Australia. However, total enrolled international students are expected to continue to decline as the number of students completing courses exceeds new commencements.

In the period between July 2020 and March 2021, the proportion of enrolled international students located in Australia declined from 83 per cent to 69 per cent, while the proportion located outside of Australia has increased over the same period from 13 per cent to 25 per cent. Overall, the total enrolled international students across all Australian states and territories declined by 11 per cent between July 2020 and March 2021.





In 2020, there was a substantial rise in international student enrolment deferments, involving either a delayed commencement or a temporary suspension of an existing enrolment. In the 15 months from 1 January 2020 to 31 March 2021, there were 127,234 enrolment deferments made by 91,516 students, over two thirds of whom were outside Australia. At the end of March 2021, 39 per cent had since recommenced studying or finished, 16 per cent had a new start date in 2021 or later and 44 per cent did not yet have a new proposed start date. International students who had deferred in 2020 and either had a new start date in 2021 or did not yet have a new proposed start date are at risk of deciding to switch to a course in another country if border restrictions and other factors in those countries are perceived as more favourable.

Economic Contribution of International Education

The falling numbers of international students studying in Western Australia had significant economic consequences for the WA economy in 2020.

ACIL Allen estimates that international students directly contributed \$373 million to the WA economy in 2020, with a further \$971 million boost to the WA economy indirectly as a result of

international student expenditure. **Overall, it is estimated that expenditure by international students contributed \$1.34 billion to the WA economy in 2020, a decline of \$761 million** (36 per cent) compared to 2019.

It is estimated that for every international student enrolled at a WA education institution, accounting for both onshore and offshore students, \$48,608 was contributed to the State's economy in 2020. The economic multiplier of international student expenditure is estimated to be 3.6, meaning every dollar of spending by an international student generated \$3.60 in value added across the WA economy in 2020.

From an employment perspective, ACIL Allen estimates that this level of expenditure supported thousands of jobs across the State in 2020. ACIL Allen estimates that the expenditure by international students in 2020 directly supported the employment of 2,701 FTE jobs, and a further 4,835 FTE jobs were indirectly created as a result of this spending, with an implied employment multiplier of 2.79.

Overall, expenditure by international students supported 7,536 direct and indirect FTE jobs across Western Australia in 2020. ACIL Allen estimates the decline in international students as a result of the impact of border closures resulted in a loss of 4,399 direct and indirect FTE jobs supported by the international education sector compared to the previous year. It is estimated that for every four international students enrolled at a WA education institution, accounting for both onshore and offshore students, an additional FTE job is supported in the State.

The economic consequences from the decline in international student numbers in WA in 2020 was equivalent to 20 per cent of the output and more than 12 per cent of all jobs in the State's hospitality sector last financial year.



Figure ES 4 Economic Contribution Results Summary - Gross Value Added and Employment

Economic Contribution by Education Sub-sector

By education sub-sector, higher education sector makes up the largest share of the overall contribution, reflecting the larger share of international students in higher education, the higher fees and living expenses associated with higher education and the longer duration of courses relative to other education sub-sectors.

ACIL Allen estimates the expenditure by international students enrolled in higher education contributed \$1.07 billion to WA's economy in 2020, equating to 80 per cent of the total economic contribution of the international education sector. The VET sector was the next largest, contributing to \$203 million to GSP, followed by schools (\$43 million), ELICOS (\$16 million) and non-award (\$9 million).

These results were well down on the previous year, with the largest impacts to non-award (down \$49 million, or 84 per cent), ELICOS (down \$78 million, or 83 per cent) and VET (down \$168 million, or 45 per cent) education sub-sectors. While the impact on the higher education sector was less extreme in percentage terms (down 30 per cent), the decline of \$458 million was the largest in volume terms.

In relation to employment impacts, higher education supported 5,999 direct and indirect FTE jobs across WA in 2020, equating to 80 per cent of the total employment supported by international students. The VET sector was the second largest contributor to total employment (1,052 FTE jobs), followed by schools (310 FTE jobs), ELICOS (120 FTE jobs) and non-award (55 FTE jobs).

The total FTE jobs (direct and indirect) supported by each of the five education sub-sectors declined in 2020 compared to the previous year. The year-on-year decline in full time jobs supported was highest for the non-award (286 FTE jobs, a fall of 84 per cent) and ELICOS education (595 FTE jobs, a fall of 83 per cent) sub-sectors. The number of full time jobs supported by the VET education sub-sector declined by 896 FTEs (46 per cent), while for the higher education and school sub-sectors the COVID-19 impact was less severe, with year-on-year declines of 2,563 FTEs (30 per cent) and 58 FTEs (16 per cent) respectively.

Economic Contribution by Source Market

ACIL Allen estimates that India and China, the top two source markets based on total number of international students in 2020, accounted for 35 per cent of the total value added contribution to GSP from international students in 2020, a decline on the 38 per cent share recorded in 2019.

International students from India, the largest source market, contributed \$254 million to the WA economy in 2020, followed by international students from China which collectively contributed \$216 million to GSP. The next three largest source markets based on contribution to GSP in 2020 were Malaysia (\$85 million), Bhutan (\$76 million) and Nepal (\$64 million).

Based on the number of international students by source market, ACIL Allen estimates that in 2020, the highest value source market on a per international student basis was Singapore, with each international student contributing on average \$55,490 to the WA economy, followed by Vietnam (\$54,108), Malaysia (\$54,053), Kenya (\$53,646) and Bhutan (\$53,446).

In relation to the employment impacts, ACIL Allen estimates that India and China, the top two source markets based on total number of international students in 2020, accounted for 35 per cent of the total number of FTE jobs supported by international students in 2020, a decline on the 38 per cent share recorded in 2019.

International students from India, the largest source market in 2020, supported 1,407 direct and indirect FTE jobs in WA, followed by international students from China who supported 1,257 direct and indirect FTE jobs. There were thousands of additional FTE jobs supported by international students from smaller source markets. The next three largest source markets based on total FTE jobs supported were Malaysia (486 FTE jobs), Bhutan (424 FTE jobs) and Nepal (354 FTE jobs).

Economic Contribution – Sectoral Impacts

ACIL Allen estimates that the education and training sector of the WA economy was the largest beneficiary of expenditure from international students, with \$373 million directly contributed to the sector (primarily in the form of course fees) and a further \$22 million indirectly to the sector. The total value added contribution (direct and indirect) to education and training declined by 32 per cent compared to 2019.

International students contribute more than just expenditure on course fees. In 2020, almost \$500 million was spent by international students on core living expenses. This is most clearly reflected in the impacts of international student expenditure on other sectors of the economy in 2020, which included rental, hiring and real estate services (\$281 million), retail trade (\$137 million) and transport, postal and warehousing (\$65 million). Similar declines in activity were recorded across these sectors as was recorded in education and training in 2020, with the largest decline recorded in retail trade which fell by 40 per cent from 2019 levels.

In relation to the employment impacts, ACIL Allen estimates that international students directly supported 2,701 FTE jobs in the education and training sector in 2020, with a further 250 FTE jobs supported on an indirect basis. The total number of FTE jobs (direct and indirect) supported in the education and training sector declined by 35 per cent compared to 2019.

On an indirect basis, expenditure from international students supported the highest number of FTE jobs in retail trade (950 FTE jobs), accommodation and food services (832 FTE jobs), transport, postal and warehousing (315 FTE jobs) and manufacturing (307 FTE jobs). The largest decline in FTE jobs supported by non-education related international student expenditure was in Retail Trade, where FTE jobs supported fell by 40 per cent from 2019 levels.

Figure ES 5 Economic Contribution from International Students, Direct and Indirect GVA by Industry



Estimated Impact of Future Border Closures

While this study has demonstrated the significant economic consequences of lower international student numbers in WA in 2020, the impacts of COVID-19 and the resulting border closures will likely continue to impact the WA economy over the next few years, until such time that borders can be opened to international students.

As international border restrictions are assumed to remain in place until mid-2022, further declines in overall student numbers studying in Western Australia are projected, with numbers not returning to 2020 levels until mid-2023, and pre-pandemic levels unlikely to be reached until beyond the forecast period.



Figure ES 6 Projected international student numbers in Western Australia 2020-2023

The impact of declining student numbers studying in Western Australia over the next few years extends beyond the reduced levels of spending in the economy. International students are also a valuable source of labour for a number of industries, including in hospitality, retail, administrative support and education and training. The reduced supply of labour to these sectors has economic consequences to Western Australia, particularly in the current environment where labour shortages are becoming more pronounced.

Expenditure impacts

The continuation of international border restrictions severely impacts the projected contribution of international students to GSP and employment in Western Australia. ACIL Allen modelled the projected impact of declining international students in Western Australia over the five semesters through to mid 2023, with the value added contribution to GSP forecast to fall from \$499.5 million in Semester 1 2021 down to a low of \$197.6 million in Semester 2 2022. As border restrictions are eased and student numbers studying in Western Australia increases, it is estimated that the value added contribution of international students to the WA economy is expected to jump to \$375.5 million by Semester 1 2023.

Overall, it is estimated that the economic contribution of international students studying in Western Australia is forecast to contract over 80 per cent, or \$1.7 billion in lost economic output relative to pre-pandemic levels in 2019 due to the lower numbers of international students studying in the State.

The profile of the projected employment contribution over the forecast period matches the profile of the projected value added contribution. In Semester 1 2021, international students are projected to support 2,820 FTE jobs across the WA economy, declining over the following three semesters to reach a low of 1,182 FTE jobs supported across the WA economy by Semester 2 2022. As borders are opened and international students return to study in Western Australia, this will in turn support an increase in job opportunities.

To put magnitude of the employment impacts into perspective, ACIL Allen estimates that the projected 4,755 fewer full time jobs supported by international students studying in Western Australia in 2022 (relative to 2019 pre-COVID levels) is greater than the total number of full time jobs created in the State in 2021 (as of May 2021).





Labour shortage impacts

The economic consequences of the projected decline in international students studying in Western Australia is also expected to further constrain the supply of available labour, and at a time when labour shortages are already starting to negatively impact on the economy. To estimate this impact, ACIL Allen applied this constraint to its computable general equilibrium model, *Tasman Global*, with results presented in terms of the loss to WA's Gross State Product from Semester 1 2021 through to Semester 1 2023.

Through the modelled labour supply shock, ACIL Allen estimates that the WA's economy will contract by \$92.9 million in Semester 1 and \$176.8 million in Semester 2, realising a full year impact of \$269.7 million in 2021. The labour supply shock is expected to be even greater in 2022, with the WA economy expected to contract by \$260.8 million in Semester 1 and \$267.1 million in Semester 2, for a full year impact of \$527.9 million in 2022.



Figure ES 8 Projected reduction in WA real economic output from estimated labour shortages

Overall, the modelled future impacts of border closures on the ability of international students to study, live and work in Western Australia is a significant economic challenge for the sector and for the WA Government.

The key findings from this study highlight the strategic importance for the State in formulating policy to help the sector to welcome back students to study, live and work in Western Australia.

Context and Purpose of this Report

1.1 The strategic and economic context

The growth and development of Western Australia's international education sector is a priority economic development objective for the McGowan Government since coming to power in 2017. This was acknowledged through the international education sector's identification as one of six priority sectors in the WA Government's, economic development framework, *Diversify WA*. Diversify WA highlights international education as one of six priority sectors based on the clear opportunity for WA to grow its international presence and brand as an education destination, underpinned by increasing urbanisation and a growing number of consumers in key source markets seeking a quality education alongside a healthy and vibrant lifestyle.

In 2020, StudyPerth commissioned ACIL Allen to quantify the economic importance of international education to the WA economy. ACIL Allen estimated that in 2019, the 53,404 international student enrolments in Western Australia boosted the State's Gross State Product by \$2.1 billion and supported almost 12,000 direct and indirect FTE jobs across Western Australia.

Since the completion of this study in April 2020, the international education sector has been hit hard by the COVID-19 pandemic, as governments around the world close their borders to the movement of people to protect the health and wellbeing of their citizens.

The impact of the COVID-19 pandemic and associated travel restrictions has continued into 2021, with a timeline on the return of international students to Western Australia remaining unclear. While the rollout of the vaccination program in WA and overseas, and the incremental opening of travel into Australia through the establishment of a travel bubble with New Zealand provides for a more positive outlook for the international education sector in WA, the financial consequences for the sector, and the economic impacts for the WA economy more broadly, are considerable.

States and territories across Australia are continuing to manage the inflow of international arrivals through the adoption of international arrival caps, in conjunction with the hotel quarantine system. Both measures provide constraints on the capacity of the states and territories to accept international arrivals. At present, international students are included as part of the international arrival cap in WA, alongside returning Australian citizens and exempted international arrivals, such as skilled labour workers for the agriculture sector. In April 2021, WA halved its international arrival cap of 1,025 returning travellers per week in response to a COVID-19 outbreak and to reduce pressure on the hotel quarantine system. New South Wales has proposed excluding international students from their international arrival cap, meaning they would not take the spots of Australians hoping to return from overseas. The state has also proposed that international students would be quarantined at a separate purpose-built facility.

Figure 1.1 outlines the status of international air passenger arrival caps and the vaccination rollout in Australia. Following the reduction of Western Australia's international arrival cap in April 2021,

the state is accepting the equal lowest number of international arrivals per week across the Australian states and territories with an international air passenger arrival cap. As of 16 June 2021, Western Australia has delivered the fourth highest total vaccine doses across all Australians states and territories.





While higher education institutions have managed to adjust to the COVID-19 pandemic through the delivery of online learning, not all education sub-sectors are adequately resourced to undertake this transition. In addition, not all education sub-sectors are conducive to the delivery of course material online and there is a growing desire from many international students for a return to face-to-face learning.

Overseas competitors in the international education sector, such as the United Kingdom, United States and Canada, continue to make efforts to facilitate the arrival of international students through reform measures to their student visa and quarantine systems, which places Western Australia and Australia at risk of losing market share as students look to these alternative destinations where face-to-face learning is being provided.

As the number of international students in Western Australia continues to fall as a result of the travel restrictions, labour and skill shortages in the state are at risk of becoming more severe. In conjunction to a declining supply of international students engaged in the WA labour force, there has also been a sharp drop in skilled migrant workers and intrastate workers arriving in the state since the start of 2020.

As presented in **Figure 1.2**, these dynamics have contributed to a decline in the unemployment rate and sharp increase in the number of job vacancies since the end of the first COVID-19 lockdown in WA. Job vacancies in WA have reached their highest level in over decade, while the unemployment rate of 4.9 per cent reported for April 2021 is the lowest rate since March 2014.



Figure 1.2 Western Australia Labour Market

The contribution of the international education sector to Western Australia extends beyond expenditure on course fees and living expenses. The economic and social contribution of the sector also provides benefits to WA such as income for education institutions to undertake important research programs, facilitating international collaboration in research, a source of demand for housing, raising cultural awareness and providing diversity and cultural richness to local WA communities. In the long term, when returning to their home countries, international students may advance to senior leadership positions within industry and Government, and continue to maintain their personal and professional networks in Western Australia.

International students are active participants in the WA labour force, as well as in their local community through volunteer roles. As with many West Australians, international students in the state were impacted by the job losses resulting from the lockdown measures in the first half of 2020. In the 2021-22 Federal Budget, the Government announced support to employers in the tourism and hospitality sectors to help them find workers, by temporarily allowing student visa holders to work more than 40 hours per fortnight, as long as they are employed in the tourism or hospitality sectors. This measure builds off previous changes announced in response to COVID-19 which allowed international students working in critical sectors, such as agriculture, health and aged care, to work more than the previous cap of 40 hours per fortnight.

As with many aspects of the response to the COVID-19 pandemic in Australia, the states and territories have adopted different approaches to finding a balance between best managing the immediate health needs of their community, while seeking to support the economy through stimulus programs for households and businesses. Targeted financial support packages have been provided to some of the education sub-sectors that make up the international education sector, as well as other industries across the economy, such as tourism and agriculture. In the 2021-22 Federal Budget, a \$54 million package of support measures targeted to ELICOS and non-university higher education providers was announced, hallmarked by \$26.1 million for an extra 5,000 short course places in 2021-22, so non-university higher education providers can attract more Australian students.

Given the significant financial and economic impacts that have resulted from COVID-19 and the associated travel restrictions on the international education sector, and the importance placed on the sector as part of the WA Government's economic development agenda, it is critical that

governments continue to look at ways in which it can support the recovery of the sector and direct it towards a sustainable pathway going forward.

1.2 About this report

In light of the significant impact that the COVID-19 pandemic and associated travel restrictions has had on the international education sector, StudyPerth engaged ACIL Allen to estimate the economic contribution of the international education sector in 2020, and compare this to the 2019 results.

In addition, StudyPerth has also sought to understand the economic outlook for the international education sector based on an assumed path back to pre-COVID-19 student numbers in Western Australia. As a result, in this study ACIL Allen has completed an additional two modelling tasks. Firstly, ACIL Allen has run an additional four simulations of its I-O model on the projected economic impacts of the international students in WA based on the forecast international student numbers in 2021 and 2022. Secondly, in order to determine the economy-wide implications of labour shortages arising from a reduction in international student numbers, ACIL Allen applied its Computable General Equilibrium (CGE) model, *Tasman Global,* to dynamically pick up the impacts of labour market constrains on sectors of the economy that typically source international students for part-time work.

In 2020, the impact of the COVID-19 pandemic on the international education sector presented some challenges for the standard reporting measures and indicators used by the Department of Education, Skills and Employment relating to the international education sector. To produce this updated study, this required ACIL Allen to review the modelling methodology and assumptions used in the previous study, and update data inputs where necessary to reflect the impact of international border restrictions. The Department of Education, Skills and Employment released a range of datasets over the course of 2020 reporting on the impact of international border restrictions, and ACIL Allen reviewed and sought clarification from the Department on these datasets to assess their suitability as data inputs for this study.

International border restrictions meant it for stakeholders in the international education sector it became increasingly important to understand the number of international students who had the intention of travelling to Western Australia but were unable to arrive in the state to complete their education course. Some of these international students continued to pursue their chosen course through online study, however for others online learning was either not possible for their chosen course or the student decided to defer or cancel their enrolment until the opening of international border restrictions enabled face-to-face learning.

While international students who studied offshore through online learning did not contribute to the WA economy through living expenses, they still contributed to the WA economy through their expenditure on course fees at WA education institutions in 2020. As a result, the onshore and offshore split of international students was a critical data input for this study, and was a distinct shift in the methodology undertaken in this report compared to the previous report.

As outlined in **Section 3**, since July 2020 the Department of Education, Skills and Employment, with the assistance of the Department of Home Affairs, have undertaken an exercise to match international student enrolment and student visa data in order to report the number of enrolled students in and outside Australia. This data is reported as points-in-time as students will move locations over the course of the year, and provides the breakdown by state at an education subsector and source market level. The location of all international students could not be accounted for in this dataset, and as a result for international students where their location has been classified as 'unknown', they have been excluded from this study.

The adoption of this dataset for the economic contribution assessment is the key change in the modelling methodology and assumptions for this study compared to the 2019 study, and was necessary in order to account for the impact of international border restrictions. In line with the previous study, average expenditure by education sub-sector has been calculated per 'international student enrolment'. However, total expenditure by education sub-sector and by source market has been estimated for 2020 using the number of international students in and outside WA reported from the data matching exercise. Consequently, the economic contribution assessment reports results per 'international student', rather than at the per 'international student enrolment' level reported in the previous study.

Section 2.2 and Section 2.3 have used the same international student enrolment dataset as the previous study to provide continuity in the reporting of trends over time in the international education sector, while Section 3.1.1 introduces the dataset from the Department's data matching exercise in order to outline the impact of the COVID-19 pandemic on the international education sector in 2020, as well as looking ahead in the short to medium term.

Finally, due to the international air passenger arrival cap and the small period of time at the start of 2020 when this cap was not in place, this study has excluded the expenditure of visiting friends and relatives (VFR) of international students as a component of the economic contribution assessment.

1.3 Report Structure

This report has been structured into five sections and an Executive Summary.

- Section 1: Context and Purpose of this Report provides strategic and economic context on the international education sector in Western Australia, and an overview of the approach undertaken by ACIL Allen to account for the impact of the COVID-19 pandemic, including important differences with the approach undertaken in the previous report.
- Section 2: Trends in International Education in WA provides important economic context supporting this study, including an overview of historical trends in the international education sector across education sub-sectors and source markets and an analysis of the factors that will support the long-term growth of the international education sector in Western Australia.
- Section 3: Modelling Methodology and Assumptions provides an overview of the modelling methodology and assumptions used by ACIL Allen to complete the economic contribution assessment and assess the projected impacts of border closures on the international education sector, as well as labour shortages on the WA economy.
- Section 4: Economic Contribution of International Education in WA the results presented in this section articulate the economic contribution that spending by international students made to Western Australia in 2020, using ACIL Allen's Input-Output modelling framework.
- Section 5: Potential economic impacts of border closures and labour shortages the results presented in this section estimate the potential economic impacts of further border closures on the WA economy as a result of the reduced expenditure of international students studying in the State, and through the impacts of lower international student numbers further constraining WA's already tight labour market.

1.4 Glossary of terms and abbreviations

The following terms and acronyms are used in this report.

Term Used	Description
Employment	The number of full-time equivalent jobs created as a result of a project or expenditure in the economy, which includes direct and indirect (flow-on) employment.
Gross product or real economic output	Gross product is a measure of the output generated by an economy over a period of time (typically a year). It represents the total dollar value of all finalised goods and services produced over a specific time period and is considered as a measure of the size of the economy. At a national level, it is referred to as Gross Domestic Product (GDP); at the state level, Gross State Product (GSP); while at a regional level, Gross Regional Product (GRP).
Input-Output Tables	Input-Output (I-O) tables capture the direct and indirect effects of expenditure by capturing, for each industry, the industries it purchases inputs from and also the industries it sells its outputs to. For example, the I-O model for Western Australia captures purchases from and sales to industries located in Western Australia, as well as imports from outside of Western Australia.

Table 1.1Glossary of Terms

Table 1.2List of Acronyms

Abbreviation	Full Name
ABS	Australian Bureau of Statistics
DESE	Department of Education, Skills and Employment
ELICOS	English Language Intensive Courses for Overseas Students
FTE	Full Time Equivalent
GDP	Gross Domestic Product
GSP	Gross State Product
IVS	International Visitor Survey
TRA	Tourism Research Australia
VET	Vocational education and training
VFR	Visiting friends and relatives

Trends in International Education in WA

This section provides important economic context supporting this study, including an overview of historical trends in the international education sector across education sub-sectors and source markets and an analysis of the factors that will support the long-term growth of the international education sector in Western Australia.

2

2.1 WA economy and international education

In the second half of 2020, the WA economy began a recovery from the first COVID-19 lockdown underpinned by investment in infrastructure projects, housing construction activity stimulated by State and Federal Government grants and a strong mining sector benefiting from an uplift in commodity prices, particularly iron ore and gold.

In 2019-20, WA Gross State Product (GSP) increased by 1.4 per cent, the highest rate of all Australian states, and behind the Northern Territory (5.3 per cent) and the ACT (2.4 per cent). With the exception of Tasmania (0.3 per cent), all other states recorded negative GSP growth in 2019-20, with South Australia (-1.4 per cent) and Queensland (-1.1 per cent) recording the largest falls.

International education is identified as one of six priority sectors in the **Diversify WA** framework. Diversify WA identified a clear opportunity for WA to grow its international presence and brand as an education destination, underpinned by increasing urbanisation and a growing number of consumers in key source markets seeking a quality education alongside a healthy and vibrant lifestyle. Diversify WA outlines the target for WA of 100,000 international students by 2025, set as part of the **International Education Strategy 2018-2025**.

While international border restrictions associated with the COVID-19 pandemic will challenge the state's ability to reach the 2025 target, the delivery of the initiatives to support the international education sector outlined in both the Diversify WA framework and the International Education Strategy will be critical to ensure WA captures the anticipated pent up demand from international students overseas when international border restrictions are phased out.

Since 2012-13, export income for Western Australia from education-related services has increased by 58 per cent to \$2.1 billion in 2019-20 (Figure 2.1). In 2019-20, Western Australia's share of national export income for education-related services was 5.6 per cent, a decline on the 8.1 per cent share recorded ten years prior. Western Australia's share of national export income for education-related services was 5.6 per cent, a decline on the indicator-related services compares unfavourably when measured against other economic indicators, where WA accounted for 16 per cent of Australia's GDP in 2019-20 and 10 per cent of Australia's population as of September 2020.



Figure 2.1 WA International Trade in Services, Education-related Services, 2009-10 to 2019-20

2.2 International student enrolments by education sub-sector

In 2020, there were 49,681 international student enrolments in WA education and training institutions, a decline of 6.5 per cent on the previous year, making it the first year since 2014 that WA recorded total international student enrolments below 50,000 (Figure 2.2). Nationally, the decline in international student was larger, with a fall of 7.4 per cent recorded in 2020.

By education sub-sector, higher education and vocational education and training (VET) account for the largest shares of total international student enrolments in WA. In 2020, higher education accounted for 48 per cent of total enrolments, while VET accounted for 33 per cent. The fastest growing education sub-sector in WA since 2005 is VET, where enrolments have increased by 388 per cent. In 2020, ELICOS¹ accounted for 14 per cent of total enrolments, followed by schools (1.5 per cent) and non-award² (2.8 per cent).

In 2020, total international student enrolments for WA had already reached 37,297 by the end of March. Over the remainder of 2020, when international travel restrictions impacted the arrival of students in WA across all source markets, there was decline in the rate of enrolments, with only 3,472 enrolments recorded between April-June and 8,892 enrolments in the last six months of 2020.

For many of the enrolments recorded in the first three months of 2020, it is likely the student may have been unable to arrive in WA, and as a result would have undertaken their course online or decided to defer or cancel their enrolment. The international student enrolment dataset from the Department of Education, Skills and Employment (DESE) has not historically covered distance education where a student remains offshore, however due to the COVID-19 restrictions on travel the data relating to the 2020 calendar year includes students that would ordinarily have been physically studying in Australia on a student visa. The dataset however doesn't provide a split between onshore and offshore students or account for deferments and cancellations. In estimating

¹ ELICOS courses support students requiring English language training before commencing formal studies.

² Non-award courses do not result in an award (or qualification) that is recognised under the Australian Qualifications Framework and generally have a duration of less than one year. These non-award courses include two broad types: foundation and other enabling courses; and mobility courses, which include study abroad and student exchange programs.

the economic contribution of international education in 2020, ACIL Allen has addressed these limitations in its methodology, which is presented in the next section.



Figure 2.2 WA International Student Enrolments by Education Sub-sector, 2005-2020

Note: There are more enrolments than international students since a student can study in more than one course in one calendar year. Note: International student enrolment data covers onshore international students studying on student visas only (visa subclasses from 570 to 575).

Source: Department of Education, Skills and Employment – International Student Data – YTD Enrolments (Dec)

Figure 2.3 presents international student commencements by education sub-sector in Western Australia since 2005. A commencement is defined as a new student enrolment in a particular course at a particular institution. Commencements are an important indicator to inform short-to-medium term enrolment projections for international students, particularly in relation to higher education where a student completing an entire undergraduate degree at a WA university will be in the state for a minimum of three years.

In 2020, total international student enrolment commencements in Western Australia declined by 20 per cent compared to the previous year, with the non-award and ELICOS education sub-sectors experiencing the highest decline in commencements at 47 per cent and 38 per cent respectively.



Figure 2.3 WA International Student Commencements by Education Sub-sector, 2005-2020

2.3 International student enrolments by source market

WA attracts international students from a diverse range of source markets. ACIL Allen has sought to highlight in this section how trends in source markets for international students have evolved over time and how source markets differ with respect to the allocation of students across the five education sub-sectors.

Figure 2.4 presents the ten largest source markets for international students in Western Australia and the breakdown of their enrolments by education sub-sector. The two largest source markets for international students in WA are India and China, accounting for 18.4 per cent and 14.3 per cent of total international student enrolments respectively in 2020. The next three largest source markets in 2020 were Malaysia (5 per cent), Bhutan (4.6 per cent) and Nepal (4.2 per cent).

In 2020, six of the ten largest source markets had a share of total international student enrolments that exceeded their ten-year average. The source markets that exceeded their ten-year average share in 2020 were India, Bhutan, Nepal, Pakistan, Colombia and the Philippines. Of the source markets that fell below their ten-year average share, the gap was largest for Malaysia and China at 2.2 per cent and 1.4 per cent respectively.







In 2020, there were international students enrolled at WA education institutions from a total 145 source markets. The five largest source markets for international students in Western Australia captured 46 per cent of total international student enrolments in 2020, while the ten largest source markets captured 64 per cent.

Figure 2.5 presents the ten largest source markets for international students enrolled in higher education in Western Australia in 2020. The seven source markets with greater than 1,000 enrolments in higher education are China, India, Malaysia, Bhutan, Singapore, Pakistan and Nepal.

The ten largest source markets for higher education in 2020 are consistent with the previous year, with the exception of the Singapore and Bhutan switching between their fourth and fifth places, and Hong Kong replacing Kenya in ninth position in 2020. All of the ten largest source markets for higher education in WA are located in the Asia region. Historically, a high proportion of international students from source markets in Europe and North America have been enrolled under the non-award education sub-sector, however this sub-sector was severely impacted by the international travel restrictions due to foundation courses and student exchange programs being broadly unconducive to online delivery.





2.4 COVID-19 and the International Education Sector

Due to the COVID-19 pandemic, international travel restrictions were progressively introduced in early 2020. This commenced with the cessation of direct travel from China from 1 February 2020, followed by further staged restrictions until all foreign entry was ceased on 20 March 2020.

When first measured in early February 2020, the proportion of Chinese student visa holders outside Australia exceeded 50 per cent, however in the period up until Australia closed its borders on 20 March 2020, Australian Border Force reported that over 47,000 Chinese citizens arrived from third countries. Consequently, by 29 March 2020 the proportion of Chinese student visa holders outside Australia had dropped to 38 per cent.

The growth in enrolled international students outside Australia completing studies online is moderating the impact of ongoing declines of enrolled international students in Australia (**Figure 2.6**). However, looking ahead it is expected that total enrolled international students will continue declining if the number of students completing courses exceeds new commencements.

In the period between July 2020 and March 2021, the proportion of enrolled international students located in Australia has declined from 83 per cent to 69 per cent, while the proportion located outside of Australia has increased over the same period from 13 per cent to 25 per cent. Between July 2020 and March 2021, total enrolled international students across all Australian states and territories declined by 11 per cent.





In 2020, there was a substantial rise in international student enrolment deferments, involving either a delayed commencement or a temporary suspension of an existing enrolment. In the 15 months from 1 January 2020 to 31 March 2021, there were 127,234 enrolment deferments made by 91,516 students, over two thirds of whom were outside Australia.³ At the end of March 2021, 39 per cent had since recommenced studying or finished, 16 per cent had a new start date in 2021 or later and 44 per cent did not yet have a new proposed start date. International students who had deferred in 2020 and either had a new start date in 2021 or did not yet have a new proposed start date are at risk of deciding to switch to a course in another country if border restrictions and other factors in those countries are perceived as more favourable.

Canada and the United Kingdom have continued to improve their reputations as appealing study destinations, whereas countries with closed borders such as Australia and New Zealand have been found to be falling behind as an attractive education destination, despite perceptions of the two countries as 'safe and stable' due to their elimination strategies and very low case numbers.⁴

Some countries, such as Canada, who are still recording high numbers of COVID-19 have been successful in improving their reputation for stability and safety and increasing the level of interest in their offering as a study destination. Canada allowed existing permit holders to travel to the country after borders were closed, it provided international students with access to the Canada Emergency Response Benefit (CERB) and it was perceived by agents to have communicated openly and positively to international students and their families throughout the COVID-19 pandemic. The Canadian Government also announced temporary changes to its Post Graduate Work Permits Program (PGWP) to extend eligibility for a PGWP to international students who need to complete their studies online from abroad.

³ Department of Education, Skills and Employment – May 2021 Research Snapshot – International students outside Australia due to COVID-19

⁴ Navitas Agent Perception Report (May 2021)

Modelling Methodology and Assumptions

This section of the report provides an overview of the methodology, assumptions and data sources used by ACIL Allen to complete the economic contribution assessment and to assess the projected impacts of the continuation of border closures on the international education sector, as well as labour shortages on the WA economy.

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3.1 Economic Contribution

The economic contribution assessment is the Phase 1 modelling component of this study. The overview provided in this section details how the methodology and assumptions, as well as the data sources, have been refined from the previous report to ensure data inputs account for the impact of COVID-19 on the international education sector in WA.

3.1.1 Phase 1 - Methodology and Assumptions

The calculation of a set of derived data inputs is a critical step prior to the commencement of the economic modelling, as most of the required data inputs are not directly available from the primary data sources of the Australian Bureau of Statistics, Department of Education, Skills and Employment, Department of Home Affairs and Tourism Research Australia.

This study focuses on expenditure from onshore and offshore international students enrolled at WA education institutions in the 2020 calendar year across the five education sub-sectors of higher education, vocational education and training (VET), schools, English Language Intensive Courses for Overseas Students (ELICOS) and non-award courses.

The study captures international students holding **student visas only**. Revenue from other forms of international education (such as education consultancy services and education and training delivered through offshore campuses), as well as students on non-student visas, are not accounted for in this study. In addition, the study does not account for the contribution from international students studying elsewhere in Australia who may decide to visit Western Australia for a holiday during their time in the country.

In 2020, due to border restrictions not all international students enrolled at WA institutions were able to enter WA to complete their studies on campus. While border restrictions on flights from China commenced in early February, most international students from other countries, particularly those enrolled in higher education, were able to arrive in WA for the start of Semester 1 prior to further border restrictions coming into place in March. Arrival in WA over the second half of the 2020 calendar year was more difficult for international students, with desktop research suggesting only a very small number of international students were able to arrive in WA, relative to other states and territories where the weekly cap on international arrivals was higher over this period. As a result, it's likely that over the second half of the 2020 calendar year the number of international students leaving WA following the completion of their course exceeded the number of international students arriving in WA to commence a course.

For the international students that had the intention of completing a course in WA in 2020 and maintained their enrolment to complete the course online as a result of the border restrictions, it is important they are included as part of the data inputs for the total international student enrolments in the economic contribution assessment. In order to estimate how many enrolled international students were in and outside WA, and had not deferred or cancelled their enrolment, Department of Education, Skills and Employment (DESE) completed a data matching exercise between international student enrolment data and student visa data sourced from the Department of Home Affairs as of 15 November 2020 (**Table 3.1**). ACIL Allen sought and received confirmation from DESE that while the same data matching exercise undertaken for this data release commenced from June 2020, these data sets have not been publicly released by the Department.

 Table 3.1
 Location of international students enrolled at WA institutions by education sub-sector as of 15 November 2020

Education sub-sector	Inside WA	Outside WA	Total
Higher Education	15,023	2,437	17,460
VET	7,770	113	7,883
Schools	595	50	645
ELICOS	1,111	223	1,334
Non-award	248	80	328
Total	24,747	2,903	27,650

Note: Excluding 1,085 international students enrolled at WA institutions where no location was assigned and whose location was categorised by the Department of Education, Skills and Employment as "Unknown".

Source: Department of Education, Skills and Employment – January 2021 Research Snapshot – November 2020 international student data update

This dataset is preferred by ACIL Allen for estimating the onshore and offshore split for international students over student visa data from the Department of Home Affairs where data matching has not taken place. This assessment is on the basis that student visa categories do not match directly to the education sub-sector categories and in some instances the student visa category assigned to an international student is not an accurate indication of the course they are completing at a particular point in time.

For instance, desktop research indicates that often ELICOS students may enter WA holding a non-student visa, such as a visitor or working holiday visa⁵, or an international student may be completing an ELICOS course however are in WA with a student visa under the higher education category on the basis that this is the final stage of their study pathway. In the period from January to June 2020, over half (51 per cent) of primary student visa grantees intending to study ELICOS entered Australia on an Independent ELICOS visa, while the remainder entered on other student visas corresponding to the endpoint of their intended study pathway (generally higher education or VET).⁶

The ABS reports export revenue for education-related services (international students) by state and territory on a financial and calendar year basis. This ABS dataset is not broken down into the five education sub-sectors of higher education, VET, schools, ELICOS and non-award at the state and territory level. In order to calculate export revenue for each education sub-sector in Western Australia, ACIL Allen used international trade in services data from the ABS, which breaks down expenditure for education related travel into the two categories of fees and goods and services by education sub-sector at the national level, and the DESE enrolment figures by education sub-sector

⁵ Department of Education, Skills and Employment – July 2020 Research Snapshot – National survey of ELICOS providers in Australia in 2019

⁶ Department of Education, Skills and Employment – Augusts 2020 Research Snapshot – Visa grants for international students intending to study ELICOS

for WA in the 2020 calendar year. For example, given that WA accounted for 5.7 per cent of national higher education enrolments in 2020, it is assumed that expenditure for fees for higher education in WA is equal to 5.7 per cent of the national expenditure for fees for higher education reported by the ABS. Fee and goods and services expenditure for the other education sub-sectors is similarly allocated.

This calculation provides ACIL Allen with the average expenditure per international student enrolment, split by fees and goods and services, for the five education sub-sectors in 2019-20 (**Table 3.2**). Average expenditure per enrolment accounts for the typical length of courses across the education sub-sectors, with expenditure for living expenses reflecting that some international students were in WA for less than six months.

	Higher education	VET	Schools	ELICOS	Non-award	Total
Fees	\$677.3m	\$121.4m	\$19.3m	\$32.9m	\$24m	\$874.9m
Living expenses	\$789.5m	\$324.4m	\$30.9m	\$63.4m	\$12.9m	\$1,221.1m
Total expenditure	\$1,466.8m	\$445.8m	\$50.2m	\$96.3m	\$36.9m	\$2,096m
Average expenditure per student – Fees and living expenses	\$61,500	\$26,661	\$65,591	\$13,890	\$26,452	NA
Fees share	46.2%	27.2%	38.4%	34.2%	65.1%	NA
Living expenses share	53.8%	72.8%	61.6%	65.8%	34.9%	NA
Source: ACIL Allen, ABS						

Table 3.2	International Student Ex	penditure in Western Australia b	y Education Sub-Sector, 2019-20
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It is assumed expenditure for international students completing a course from outside WA in their home country (i.e. online or distance learning) is only through fees, while expenditure for international students who are completing a course onshore is through both fees and living expenses as per the previous report.

Accounting for the onshore and offshore split in international students, the revised total expenditure for international students enrolled at WA institutions for the 2020 calendar year is **\$1.26 billion**, a 36.6 per cent decline on the estimated total expenditure by international students for the 2019 calendar year (**Table 3.3**).

Table 3.3	Expenditure for onshore and offshore international students enrolled at WA institutions, 202	0
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Education sub- sector	Fees	Living expenses	Inside WA	Outside WA (Fees only)	Total		
Higher Education	\$425.6m	\$497.3m	\$923.9m	\$69.2m	\$993.1m		
VET	\$56.4m	\$150.7m	\$207.2m	\$0.8m	\$208m		
Schools	\$15m	\$24m	\$39m	\$1.3m	\$40.3m		
ELICOS	\$5.3m	\$10.2m	\$15.4m	\$1.1m	\$16.5m		
Non-award	\$4.3m	\$2.3m	\$6.6m	\$1.4m	\$7.9m		
Total	\$507.6m	\$684.5m	\$1,192.1m	\$72.3m	\$1,265.8m		
Source: ACIL Allen, ABS, Department of Education, Skills and Employment							

Applying the average expenditure per enrolment and the DESE data for the location of enrolled international students at WA institutions, ACIL Allen calculated the expenditure for both fees and goods and services by education sub-sector for 17 source markets. ACIL Allen have used the same set of source markets as the 2019 study.

Table 3.4 describes in further detail the derived data inputs calculated by ACIL Allen, and additional assumptions applied for these calculations that have not been outlined above.

Table 3.4Derived Data Inputs

Derived data inputs	Data Sources (Table 3.5)	Assumptions
Expenditure		
International student expenditure by education sub-sector	1, 2, 3, 4	- Following the removal of expenditure from the Ausaid and Defence international student category in Source 4, an inflator was used to reconcile the estimated total expenditure across all education sub-sectors with the WA education-related services international trade total in Source 3.
		-The average fee for an enrolment in each education sub-sector is the same across Australian states and territories.
International student expenditure by market market source	1, 2, 3, 4	-For comparative purposes, the selected countries match the same set of countries as the previous ACIL Allen report, whereby the criteria was total international student enrolments greater than 1,000.
Expenditure profile		
International student expenditure profile by education sub-sector	5	-Expenditure allocated to education fees based on derived expenditure by education sub-sector calculations.
		-Expenditure not allocated to education fees is categorised as "Living expenses".
		-Expenditure for offshore students is only allocated to education fees. All living expenses occur in the source country and can't be attributed to Western Australia.
		-TRA expenditure profile categories of package tour, pre-paid international airfares and conference fees are excluded.
		-Expenditure profile for living expenses is based on the aggregate expenditure profile for living expenses across all market sources (calculated in the input below). This assumes students in each education sub-sector have the same consumption bundle.
International student expenditure by market source	5	-Higher income Asian countries allocated the TRA expenditure profile for visitors (all categories of travel) to Australia from China (China, Malaysia, Singapore, Taiwan, Hong Kong, Japan, South Korea).
		-Remaining selected countries allocated the TRA expenditure profile for visitors to Australia from 'Other' (which accounts for all countries other than China, US, UK, New Zealand and Japan).
		-"All other countries" allocated the TRA expenditure profile for visitors to Australia from 'Other'.

3.1.2 Phase 1 - Data Sources

Table 3.5 lists the data sources used by ACIL Allen for the economic contribution assessment. As outlined, border restrictions due to COVID-19 and the sharp increase in enrolment deferments and cancellations impacted the accuracy of a number of routine datasets released by DESE. As a result, it was essential that ACIL Allen reviewed the interim and additional datasets released by DESE at the end of 2020 and early 2021 that sought to account for the onshore and offshore split of enrolled international students.

Table 3.5 Data and Assumption Sources – Phase 1 Modelling

No.	Data category	Source
1	2020 YTD WA international student enrolment by education sub- sector and market source	DESE – International Student Data
2	Location of WA international student enrolments, by education sub- sector and market source, as at 15 November 2020	DESE – January 2021 Research Snapshot – November 2020 international student data update
3	2019-20 International Trade in Services, Credits, State by Financial Year – WA	ABS 5368.0.55.003 - International Trade: Supplementary Information, Financial Year
4	2019-20 International Trade in Services, Credits, Education Related Travel, by Educational Sector, by Type of Expenditure by Financial Year	ABS 5368.0.55.003 - International Trade: Supplementary Information, Financial Year
5	2020 Expenditure Profile for International Visitors by Country of Origin	Tourism Research Australia – International Visitor Survey

Figure 3.1 summarises how each of the data sources are used to calculate the derived data inputs for the Input-Output (IO) modelling.





3.2 Potential economic impacts of border closures and labour shortages

The estimation of the potential economic impacts of international border closures and labour shortages is the Phase 2 modelling component of this study. The overview provided in this section details the methodology and assumptions, as well as the data sources, used to complete the Phase 2 modelling.

3.2.1 Phase 2 - Methodology and Assumptions

International student projections

Projections on international student numbers in Western Australia depend on the propensity of international students outside WA to commence new courses and the rate at which international students may be able to enter WA as international border restrictions ease. The arrivals of

international students is also influenced by the management of the international arrival cap, the rollout of the vaccination program and the continuation of the hotel quarantine system and / or alternative quarantine arrangements.

The 2021-22 Federal Budget provides the most recent indication on assumptions relating to the vaccination rollout and international travel. The key assumptions underpinning the economic forecasts include the following:

- A population-wide vaccination program is likely to be in place by the end of 2021.
- Small phased programs for international students will commence in late 2021 and gradually increase from 2022.
- The rate of international arrivals will continue to be constrained by state and territory quarantine caps over 2021 and the first half of 2022, with the exception of passengers from Safe Travel Zones.
- Inbound and outbound international travel is expected to remain low through to mid-2022, after which a gradual recovery in international tourism is assumed to occur.

ACIL Allen acknowledges that Western Australia has previously secured a reduction in the international arrival cap, and as a result the application of the assumptions outlined above and forecasts for the international education sector in Western Australia are subject to operational and policy decisions made by the WA Government.

It should also be noted that while the rollout of population-wide vaccination programs in other countries will be a factor in the return to international travel, given the breadth of source markets associated with the international education sector, it is not feasible to make assumptions on the opening of international travel at the individual source market level.

Figure 3.2 presents the forecast for total international student numbers in Western Australia over the period from the end of 2020 through until the completion of Semester 1 in 2023. The forecast has been undertaken based on three components:

- 1. Course completions for enrolled international students (as of 15 November 2020)
- 2. Course commencements for new international students
- 3. Course completions for new international students

As outlined in **Table 3.8**, input data for all three components has been sourced from research snapshots released by DESE in Q1 2021.

As international border restrictions are assumed to remain in place until mid-2022, enrolled international students (as of November 2020) are expected to gradually be completing their courses. All enrolled students are assumed to have completed their course by the end of 2022. The declining number of enrolled international students are forecast to result in total international student numbers reaching a minimum of 8,086 by the start of Semester 2 in 2022.

While commencements from new international students will moderate the impact of ongoing declines of enrolled international students, this will not exceed the number of course completions and therefore not reverse the downward trend in total international student numbers.

Commencements across all education sub-sectors through until mid-2022 are based on the monthly average of new international student commencements of 324 recorded over the five month period from July-November 2020 in WA. Following the easing of international border restrictions in mid-2022, new international student commencements will occur at a monthly average of 1,405 based on the monthly average recorded pre-COVID-19 from July-November 2019 in WA. ACIL Allen has accounted for pent up demand from international students overseas to return to WA by applying a 25 per cent, 50 per cent, 75 per cent and 100 per cent scaling factor on new international student commencements in Q3 2022, Q4 2022, Q1 2023 and Q2 2023 respectively.

Many new international students commencing a course during the forecast period will complete their course by the end of Semester 2 2023. ACIL Allen has accounted for course completions from new international students over the forecast period by assuming an average course duration of three years for higher education, two years for VET, two years (complete at the end of the school year in Q4) for schools, six months for ELICOS and six months for non-award.

It is estimated total international student numbers will reach 26,173 by the end of the forecast period in mid-2023.

The forecast for international student numbers should be interpreted with the following caveats:

- The nominated end date for an enrolled international student may change as a result of a
 decision by the student to extend their course or enrol in a new course. In addition, an
 international student commencing a course online may transition to face-to-face learning if
 permitted by changes to international border restrictions.
- Forecast international student numbers can be broken down by education sub-sector, but not by source market due to the high degree of uncertainty around the phased opening of international borders and the commencement of travel bubbles to select source markets.

Figure 3.2 Western Australia – International student numbers forecast



Note: Enrolled International student numbers at the start of the forecast period is as of 15 November 2020 and includes international students enrolled at WA institutions where no location was assigned and whose location was categorised by the Department of Education, Skills and Employment as "Unknown". Source: ACIL Allen analysis of Department of Education, Skills and Employment data

ACIL Allen has assumed all new international student commencements in WA prior to mid-2022 will complete their course online.

International students have demonstrated a willingness to quarantine and get a vaccination in order to meet their desire for a return to studying on-campus. A survey from IDP Research examined the attitudes and intentions of over 6,000 prospective international students between 16 March and 5 April 2021.⁷ The survey found attitudes to online study differ depending on the destination country of choice. Of the international students with Australia as their destination country of choice, 43 per cent indicated they would defer until they can study face-to-face, 38 per cent indicated they would continue with their study plans, even if courses start online, as long as they can transition and 11 per cent were undecided on what to do next with their study plans.

As a result, following the phased opening of international borders after mid-2022, it is assumed that approximately 93 per cent of international students will decide to complete their course onshore in WA, with the remainder studying online.

As presented in **Figure 3.3**, the total number of onshore international students will decline sharply through to mid-2022, at which point the phased opening of international travel will see the number of onshore international students increase through until the end of the forecast period.



Figure 3.3 Western Australia – International student numbers forecast by student location

Note: International student numbers are based on the beginning of the quarter. As a result, changes in course completions and commencements are first reflected in the quarter after the completion or commencement occurs.

2022 Q2

2022 Q3

2022 Q4

2023 Q1

2023 Q2

2023 Q3

2022 Q1

Source: ACIL Allen analysis of Department of Education, Skills and Employment data

2021 Q2

2021 Q3

2021 Q4

End 2020 2021 Q1

Labour shortages

Across a range of industries in WA, international students make an important contribution to the labour force. There are a number of reasons why international students seek employment opportunities, including paying for daily living necessities, gaining professional work experience and improving language and communication skills. ACIL Allen has assumed a **68.5 per cent** labour force participation rate for international students in WA, based on the five-year average for the labour force participation rate for 15-24 year olds in WA recorded by the ABS. For international students who work in WA, it is assumed they work an average of **17 hours per week**.

The forecasted decline in total onshore international students over the period through until mid-2023 (**Figure 3.3**) will contribute to existing labour and skill shortages in key industries across the

⁷ IDP Connect – International Student Crossroads IV – International Student Perceptions, Choices and Motivations during COVID-19 (April 2021)

WA economy. The number of international students no longer available to engage in the WA labour force due to the continuation of international border restrictions can be estimated by calculating the gap between the total number of onshore international students at the end of 2020 and at each guarter across the forecast period.

To subsequently estimate the number of workers lost to specific industries, the gap in onshore international students is applied to the assumed 68.5 per cent labour force participation rate and the occupations undertaken by international students. As presented in **Table 3.6**, international students are typically employed across a range of occupations, primarily within accommodation and food services, health care and social assistance and retail trade.

Occupation	Industry	Share
Waiters / waitresses	Accommodation and food services	14.4%
Fast food workers	Accommodation and food services	13.7%
Cleaners and laundry workers	Other services	12%
Kitchenhands	Accommodation and food services	11.7%
Support worker	Health care and social assistance	10.8%
Sales assistants	Retail trade	8.8%
Café workers	Accommodation and food services	8%
Chefs / cooks	Accommodation and food services	7.5%
Education aides	Education and training	5.6%
Bar attendants and baristas	Accommodation and food services	4.8%
Checkout operators	Retail trade	3.7%
Receptionists	Administrative and support services	3.6%
Private tutors	Education and training	3.5%
Pharmacy assistants	Retail trade	0.3%

Table 3.6 Most common occupations for international students

Note: Survey respondents may have indicated their employment across more than one occupation. Source: StudyNT – Economic Contribution of International Education and Training to the Northern Territory (2019)

Table 3.7 presents the estimated labour shortage by occupation in Western Australia compared to the estimated number of international students in each of the occupations at the end of 2020. Labour shortages are forecasted to peak over the course of 2022, with the easing of international border restrictions forecast to moderate the impact of labour shortages from Semester 1 2023 onwards. Across occupations, the estimated labour shortage is projected to be largest for roles such as waiters / waitresses, fast food workers, cleaners and laundry workers, kitchenhands and support workers.

Table 3.7	Estimated labour s	hortage by occupatio	n compared to the	end of 2020 - Headcoun
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Occupations	Industry	Semester 1 2021	Semester 2 2021	Semester 1 2022	Semester 2 2022	Semester 1 2023
Waiters / waitresses	Accommodation and food services	697	1,269	1,795	1,813	1,054
Fast food workers	Accommodation and food services	663	1,208	1,708	1,725	1,003
Cleaners and laundry workers	Other services	580	1,058	1,496	1,511	878
Kitchenhands	Accommodation and food services	566	1,031	1,459	1,473	856
Support worker	Health care and social assistance	522	952	1,346	1,359	790
Sales assistants	Retail trade	426	776	1,097	1,108	644

Occupations	Industry	Semester 1 2021	Semester 2 2021	Semester 1 2022	Semester 2 2022	Semester 1 2023
Café workers	Accommodation and food services	387	705	997	1,007	585
Chefs / cooks	Accommodation and food services	363	661	935	944	549
Education aides	Education and training	271	494	698	705	410
Bar attendants and baristas	Accommodation and food services	232	423	598	604	351
Checkout operators	Retail trade	179	326	461	466	271
Receptionists	Administrative and support services	174	317	449	453	263
Private tutors	Education and training	169	309	436	441	256
Pharmacy assistants	Retail trade	15	26	37	38	22
Total		5,244	9,555	13,514	13,645	7,932
Source: ACII Allen						

3.2.2 Phase 2 - Data sources

Table 3.8 lists the data sources used by ACIL Allen for the estimation of the potential economic impacts of international border closures and labour shortages.

Table 3.8 Data and Assumption Sources – Phase 2 Modelling

No.	Data / Assumption category	Source
1	Projected timeline for the opening of international travel and the vaccination rollout	2021-22 Federal Budget – Budget Paper No.1 – Key assumptions underpinning the economic forecasts (p.36)
2	International student numbers in November 2020	Department of Education, Skills and Employment – January 2021 Research Snapshot – November 2020 international student data update
3	Projected international student commencements	Department of Education, Skills and Employment – January 2021 Research Snapshot – <i>Student</i> <i>commencements in the period July – November</i> 2020
4	Course end date for current enrolled international students	Department of Education, Skills and Employment – January 2021 Research Snapshot – <i>Returning student</i> <i>enrolments in 2021</i>
5	WA international student labour force participation rate	ABS Cat. 6202.0 – Labour force status for 15-24 year olds by State, Territory and Educational attendance
6	International student average hours worked per week and occupations in the labour force	StudyNT – Economic Contribution of International Education and Training (2019)

Economic Contribution of International Education

The results presented in this section articulate the contribution that spending by international students made to Western Australia's economy in 2020, using ACIL Allen's Input-Output modelling framework. The economic contribution has been measured in terms of the direct and indirect contribution to value added (Gross State Product) and employment on a full time equivalent (FTE) basis. The results of ACIL Allen's analysis and modelling are also presented by education sub-sector, by source market, and by industry. In order to highlight the impact of COVID-19 on the international education sector, ACIL Allen has also compared the 2020 results to those presented in the 2019 study.

Appendix B presents the detailed results table from the economic contribution assessment.

4.1 Overall Results

The economic consequences from the decline in international student numbers in WA in 2020 was equivalent to 20% of the output and more than 12% of all jobs in the State's hospitality sector last financial year. ACIL Allen estimates that international students directly contributed \$373 million to the WA economy in 2020, with a further \$971 million boost to the WA economy indirectly as a result of international student expenditure (Figure 4.1). Overall, it is estimated that expenditure by international students contributed \$1.34 billion to the WA economy in 2020, a decline of \$761 million (36 per cent) compared to 2019. To put this into perspective, ACIL Allen estimates that the lost economic output from the decline in international student numbers in Western Australia in 2020 was equivalent to almost 20 per cent of the total output from the hospitality industry last financial year.

It is estimated that for every international student enrolled at a WA education institution, accounting for both onshore and offshore students, \$48,608 was contributed to the State's economy in 2020. The economic multiplier of international student expenditure is estimated to be 3.6, meaning every dollar of spending by an international student generated \$3.60 in value added across the WA economy in 2020.

From an employment perspective, ACIL Allen estimates that this level of expenditure supported thousands of jobs across the State in 2020. ACIL Allen estimates that the expenditure by international students in 2020 directly supported the employment of 2,701 FTE jobs, and a further 4,835 FTE jobs were indirectly created as a result of this spending, with an implied employment multiplier of 2.79.

Overall, expenditure by international students supported 7,536 direct and indirect FTE jobs across Western Australia in 2020. ACIL Allen estimates the decline in international students as a result of the impact of border closures resulted 4,399 fewer direct and indirect FTE jobs supported by the international education sector compared to the previous year. To put this into perspective, ACIL Allen estimates that the lost full time jobs from the decline in international student numbers in Western Australia in 2020 was equivalent to more than 12 per cent of all full time jobs in the State's hospitality sector las financial year.

Notwithstanding the reduced student numbers, ACIL Allen estimates that for every four international students enrolled at a WA education institution⁸, an additional FTE job is supported in the State.



Figure 4.1 Economic Contribution Results Summary – Gross Value Added and Employment

4.2 Economic Contribution by Education Sub-sector

ACIL Allen has estimated the economic contribution of international students in Western Australia by education sub-sector. When assessing the implications of the results presented below, it is important to recognise that the duration and associated fee structures for each of the education sub-sectors differs substantially. For instance, an international student enrolled in higher education is likely to have the longest duration of time spent in WA over the course of a year and the fees associated with higher education courses are significantly higher compared to other education sub-sectors.

4.2.1 Gross State Product

Expenditure by international students enrolled in higher education contributed over one billion dollars to WA's economy in 2020 **Figure 4.2** presents the value added contribution to GSP from international students by education sub-sector. The higher education sector makes up the largest share of the overall contribution, reflecting the larger share of international students in higher education, the higher fees and living expenses associated with higher education and the longer duration of courses relative to other education sub-sectors.

ACIL Allen estimates the expenditure by international students enrolled in higher education contributed \$1.07 billion to WA's economy in 2020, equating to 80 per cent of the total economic contribution of the international education sector. The VET sector was the next largest, contributing to \$203 million to GSP, followed by schools (\$43 million), ELICOS (\$16 million) and non-award (\$9 million).

These results were well down on the previous year, as presented in **Figure 4.2**. The year-on-year decline in value added contribution was highest for the non-award (down \$49 million, or 84 per

⁸ Enrolled students includes those studying in WA and those studying online outside of WA.

cent) and ELICOS education sub-sectors (down \$78 million, or 83 per cent). The value added contribution of the VET education sub-sector declined by \$168 million (45 per cent), while for the higher education and school education sub-sectors the COVID-19 impact was less extreme, with year-on-year declines of \$458 million (30 per cent) and \$8 million (16 per cent) respectively.

Based on the number of international students in each education sub-sector, ACIL Allen estimates that in 2020, schools contributed the highest on an average per international student basis, with each international student contributing \$67,146 to WA's economy. Across other education sub-sectors, ACIL Allen estimates that every international student in higher education contributed \$61,439 to WA's economy, every non-award international student contributed \$28,526 to WA's economy, while for VET it was \$25,746 per international student and for ELICOS it was \$11,748 per international student.



Figure 4.2 Value Added Contribution from International Students by Education Sub-sector, Direct and Indirect GVA, \$m

4.2.2 Employment

Figure 4.3 presents the employment supported by international students by education sub-sector. Higher education again provided the largest boost to jobs of all education sub-sectors, reflecting the larger share of international students in higher education, the higher fees and living expenses associated with higher education and the longer duration of courses relative to other education sub-sectors.

Higher education supported 5,999 direct and indirect FTE jobs across WA in 2020, equating to 80 per cent of the total employment supported by international students. The VET sector was the second largest contributor to total employment (1,052 FTE jobs), followed by schools (310 FTE jobs), ELICOS (120 FTE jobs) and non-award (55 FTE jobs).

The total FTE jobs (direct and indirect) supported by each of the five education sub-sectors declined in 2020 compared to the previous year. The year-on-year decline in FTE jobs supported was highest for the non-award 286 FTE jobs (a fall of 84 per cent) and ELICOS education 595 FTE jobs (a fall of 83 per cent) sub-sectors. The number of FTE jobs supported by the VET education sub-sector declined by 896 (46 per cent), while for the higher education and school sub-sectors the COVID-19 impact was less severe, with year-on-year declines of 2,563 (30 per cent) and 58 (16 per cent) respectively.

Did you know that for every 3 international students studying in universities, one full time job is created in WA? Based on the number of international students in each education sub-sector, ACIL Allen estimates that in 2020 on average one FTE job was supported in the WA economy for:

- every 3 international students in higher education;
- every 7 international students in VET;
- every 2 international students in schools;
- every 11 international students in ELICOS; and
- every 6 international students in the non-award sector.

Figure 4.3 Employment Contribution from International Students by Education Sub-sector, Direct and Indirect FTE Jobs



4.3 Economic Contribution by Source Market

ACIL Allen has estimated the economic contribution of international students in Western Australia by source markets. For comparative purposes, ACIL Allen have selected the same 17 source markets that were used in the 2020 report, with the remaining source markets included under the 'All Others' category.

When drawing key points and assessing the implications of the results presented below, it is important to recognise differences across source markets reflect variations in education sub-sector compositions (eg. a low proportion enrolled in higher education) and variations in relative spending patterns which have been adjusted for through the allocation of expenditure profiles based on the relative wealth of the source market (see **Table 3.4**).

4.3.1 Gross State Product

Figure 4.4 presents the value added contribution to GSP from international students by source market. ACIL Allen estimates that India and China, the top two source markets based on total number of international students in 2020, accounted for 35 per cent of the total value added contribution to GSP from international students in 2020, a decline on the 38 per cent share recorded in 2019.

Expenditure by international students from India, the largest source market, contributed \$254 million to the WA economy in 2020, followed by international students from China which contributed \$216 million to GSP. The next three largest source markets based on contribution to GSP in 2020 were Malaysia (\$85 million), Bhutan (\$76 million) and Nepal (\$64 million).

The total value added contribution (direct and indirect) of all 17 selected source markets declined in 2020 compared to the previous year. The year-on-year decline was highest for Japan which fell by \$15 million (61 per cent), followed by Taiwan (\$17 million, 57 per cent), Brazil (\$20 million, 46 per cent) and China (\$176 million, 45 per cent). While still recording year-on-year declines, the impact of COVID-19 on value added contribution was the least pronounced for Nepal which declined by \$15 million (19 per cent), followed by Bhutan (\$19 million, 20 per cent) and Hong Kong (\$14 million, 25 per cent).

Based on the number of international students by source market, ACIL Allen estimates that in 2020, the highest value source market on a per international student basis was Singapore, with each international student contributing on average \$55,490 to the WA economy, followed by Vietnam (\$54,108), Malaysia (\$54,053), Kenya (\$53,646) and Bhutan (\$53,446).



Figure 4.4 Value Added Contribution from International Students by Source Market, Direct and Indirect GVA, \$m

4.3.2 Employment

Indian and Chinese international students enrolled at WA education institutions generated \$470 million in economic activity in 2020 **Figure 4.5** presents the employment supported by international students by source market. ACIL Allen estimates that India and China, the top two source markets based on total number of international students in 2020, accounted for 35 per cent of the total number of FTE jobs supported by international students in 2020, a decline on the 38 per cent share recorded in 2019.

International students from India, the largest source market in 2020, supported 1,407 direct and indirect FTE jobs in WA, followed by international students from China who supported 1,257 direct and indirect FTE jobs. There were thousands of additional FTE jobs supported by international students from smaller source markets. The next three largest source markets based on total FTE jobs supported were Malaysia (486 FTE jobs), Bhutan (424 FTE jobs) and Nepal (354 FTE jobs).

The total FTE jobs (direct and indirect) supported by all 17 selected source markets declined in 2020 compared to the previous year. The year-on-year decline was the highest for Japan which fell by 87 FTE (63 per cent), followed by Taiwan (94 FTE, 58 per cent), Brazil (109 FTE, 47 per cent)

and Kenya (148 FTE, 45 per cent). While still recording year-on-year declines, the impact of COVID-19 on the number of FTE jobs supported was the least pronounced for Nepal which declined by 89 FTE (20 per cent), followed by Bhutan (111 FTE, 21 per cent) and Hong Kong (84 FTE, 25 per cent).

Based on the number of international students by source market, ACIL Allen estimates that in 2020 on average one FTE job was supported in the WA economy for every three international students from China, Malaysia, Bhutan, Pakistan, Vietnam, Singapore, Hong Kong, Kenya and Indonesia.





4.4 Economic Contribution by Industry

ACIL Allen has estimated the economic contribution of international students by industry to demonstrate the broader impacts arising from international students studying in Western Australia.

4.4.1 Gross State Product

Figure 4.6 presents the value added contribution to GSP from international students by industry. ACIL Allen estimates that the education and training sector of the WA economy was the largest beneficiary of expenditure from international students, with \$373 million directly contributed to the sector (primarily in the form of course fees) and a further \$22 million indirectly to the sector. The total value added contribution (direct and indirect) to education and training declined by 32 per cent compared to 2019.

Similar declines in activity were recorded in other sectors of the economy in 2020, where international students generate indirect benefits from spending that is not related to the provision of education. The three largest sectors in terms of value added contribution in 2020, excluding

International students contribute more than just expenditure on course fees. In 2020, almost \$500 million was spent by international students on core living expenses. education and training, were rental, hiring and real estate services (\$281 million)⁹, retail trade (\$137 million) and transport, postal and warehousing (\$65 million). This reflects how a significant proportion of living expenses for international students are directed towards core services and items such as housing, retail spending and transport. Across these sectors, the largest decline was recorded in retail trade which fell by 40 per cent from 2019 levels.





4.4.2 Employment

Figure 4.7 presents the employment supported by international students by industry.

ACIL Allen estimates that international students **directly supported 2,701 FTE jobs in the education and training sector in 2020, with a further 250 FTE jobs supported on an indirect basis**. The total number of FTE jobs (direct and indirect) supported in the education and training sector declined by 35 per cent compared to 2019.

On an indirect basis, expenditure from international students supported the highest number of FTE jobs in retail trade (950 FTE jobs), accommodation and food services (832 FTE jobs), transport, postal and warehousing (315 FTE jobs) and manufacturing (307 FTE jobs).¹⁰ Retail trade recorded the highest year-on-year decline in the number of FTE jobs supported of 40 per cent.

⁹ Expenditure allocated as "Food, drink and accommodation" under the TRA expenditure profile framework has been split by ACIL Allen across four I-O modelling industry categories. The accommodation component of the I-O modelling industry category "Accommodation and food services" accounts for hotels, but not renting a home or apartment. Renting a home or apartment is categorised under the I-O modelling industry category of "Rental, hiring and real estate services".

¹⁰ "Accommodation and food services" has a high labour to capital ratio, while "Rental, hiring and real estate services" has a high capital to labour ratio.



Figure 4.7 Employment Contribution from International Students, Direct and Indirect FTE Jobs by Industry

Estimated Impact of Future Border Closures

The results presented in this section estimate the potential economic impacts of further border closures on the WA economy arising from the lower international student numbers studying and working in the State.

5.1 Introduction

It is estimated that international student numbers studying in WA will not return to pre-pandemic levels until beyond the forecast period The previous section highlighted the economic contribution of international students on the WA economy during the COVID-19-affected 2020 school year. ACIL Allen's analysis found that expenditure by international students had a \$761 million impact on the WA economy, and resulted in 4,399 fewer direct and indirect FTE jobs compared to the previous year.

Unfortunately, the impacts of COVID-19 and the resulting border closures will likely continue to have significant economic consequences to the WA economy over the next few years, until such time that borders can be opened to international students.

As international border restrictions are assumed to remain in place until mid-2022, further declines in overall student numbers studying in Western Australia are projected, with numbers not returning to close to end of 2020 numbers until mid-2023 and pre-pandemic levels until beyond the forecast period. The projected numbers of international students studying in Western Australia from 2021 through to 2023 is presented in **Figure 5.1** below, with further details on the methodology used to generate these projections presented in Section 3.2.



Figure 5.1 Projected international student numbers in Western Australia 2020-2023

However, the impact of declining student numbers studying in Western Australia over the next few years extends beyond the reduced levels of spending in the economy. International students are also a valuable source of labour for a number of industries, including in hospitality, retail, administrative support and education and training. The reduced supply of labour to these sectors has economic consequences to Western Australia, particularly in the current environment where labour shortages are becoming more pronounced.

For the purposes of this study, ACIL Allen has estimated the number of international students no longer available to engage in the WA labour force due to the continuation of international border restrictions by calculating the gap between the total number of onshore international students at the end of 2020 and at each quarter across the forecast period.

Further details on ACIL Allen's methodology in calculating the reduced supply of labour is presented in Section 3.2 of this report.

5.2 Expenditure impacts – Semester 1 2021 to Semester 1 2023

The economic consequences of border closures on international students studying in WA is estimated to cost the State's economy \$1.7 billion in 2022 The continuation of international border restrictions severely impacts the projected contribution of international students to GSP and employment in Western Australia. **Figure 5.2** presents the projected value added contribution to GSP from international students in Western Australia over the five semesters through to mid 2023. In Semester 1 2021, international students are projected to make a value added contribution to GSP of \$499.5 million.

The value added contribution to GSP is projected to decline over the following three semesters to reach a low of \$197.6 million in Semester 2 2022. As border restrictions are eased and student numbers studying in Western Australia increases, it is estimated that the value added contribution of international students to the WA economy is expected to jump to \$375.5 million by Semester 1 2023.

As **Figure 5.2** shows, the continuation of border closures has severe economic consequences for Western Australia, with the GVA contribution of international students forecast to fall by over 80 per cent from the 2019 pre-COVID-19 levels (\$1.05 billion per semester) by Semester 2 2022. To put this impact into perspective, the estimated \$1.7 billion in lost economic output from the lower numbers of international students studying in Western Australia in 2022 is equivalent to just over 20 per cent of the total economic output from the State's Retail Sector in 2019-20.



Figure 5.2 Projected GVA contribution of international students in Western Australia, By Semester

Lower overseas students in WA will mean up to 4,755 fewer full time jobs supported in 2022 compared to pre-COVID levels – more than the State's total full time jobs created in 2021 (as of May 2021)

Figure 5.3

5,000 FTE

4,000 FTE

3.000 FTE

2,000 FTE

1.000 FTE

0 FTE

Source: ACIL Allen

2019 Semester

Average

Figure 5.3 presents the projected employment contribution from international students in Western Australia over the five semesters through to mid-2023. The profile of the projected employment contribution over the forecast period matches the profile of the projected value added contribution.

In Semester 1 2021, international students are projected to support 2,820 FTE jobs across the WA economy, declining over the following three semesters to reach a low of 1,182 FTE jobs supported across the WA economy by Semester 2 2022. As borders are opened and international students return to study in Western Australia, this will in turn support an increase in job opportunities.

As highlighted in **Figure 5.3**, the severe economic consequences of border closures is also reflected in the falls in the number of jobs that are supported by the stimulus created by international students – with a decline of over 80 per cent from the 2019 pre-COVID-19 levels (per semester) by Semester 2 2022.

To put these employment impacts into perspective, ACIL Allen estimates that the projected 4,755 fewer full time jobs supported by international students studying in Western Australia in 2022 (relative to 2019 pre-COVID levels) is greater than the total number of full time jobs created in the State in 2021 (as of May 2021).



5,000 FTE

4,000 FTE

3,000 FTE

2,000 FTE

1.000 FTF

2020 Semester

Average

0 FTE

Projected employment contribution of international students in Western Australia, By Semester, FTE

5.3 Labour shortage impacts – Semester 1 2021 to Semester 1 2023

Sem 1 2021

The economic consequences of the projected decline in international students studying in Western Australia is also expected to further constrain the supply of available labour, and at a time when labour shortages are already starting to negatively impact on the economy.

Sem 2 2021

Sem 1 2022

Sem 2 2022

Sem 1 2023

While labour shortages in the primary industries of the WA economy such as mining and agriculture have been well publicised, the decline of international students is contributing to the widespread prevalence of labour shortages across other sectors that have large part time and casual workforces, including accommodation and food services, retail trade and health care and social assistance.

The estimated supply shock created by the reduced levels of labour available for the key sectors of the economy that employ international students is presented in **Figure 5.4** below. For further information on ACIL Allen's methodology used to derive the labour supply shock arising from the impact of border closures on international students studying in Western Australia is presented in Section 3.2.



Figure 5.4 Projected labour supply shock from border closures on international students studying in WA compared to the end of 2020, number of roles by sector

International students studying in WA are also a valuable source of labour for many sectors of the economy. The reduced supply of available labour in WA is estimated will choke off up to \$528 million in economic activity in 2022

The economy-wide impacts of the labour market constraints created by the continued border closures on international students studying and working in Western Australia is presented below. To estimate this impact, ACIL Allen applied this constraint to its computable general equilibrium model, *Tasman Global,* with results presented in terms of the loss to WA's Gross State Product from Semester 1 2021 through to Semester 1 2023 (**Figure 5.5**).

Through the modelled labour supply shock, ACIL Allen estimates that the WA's economy will contract by \$92.9 million in Semester 1 and \$176.8 million in Semester 2, realising a full year impact of \$269.7 million in 2021. The labour supply shock is expected to be even greater in 2022, with the WA economy expected to contract by \$260.8 million in Semester 1 and \$267.1 million in Semester 2, for a full year impact of \$527.9 million in 2022.



Figure 5.5 Projected reduction in WA real economic output from estimated labour shortages

To put this impact into perspective, the estimated full year impact of the lost economic output arising from the ongoing border closures to international students into Western Australia in 2022 is

equivalent to five per cent of the total output produced by the State's Education and Training Sector last financial year.

Appendices

ACIL Allen's Economic Models

A.1 Input Output Modelling

I-O models capture the direct and indirect effects of expenditure by capturing, for each industry, the industries it purchases inputs from and also the industries it sells its outputs to. For example, the I-O model for Western Australia captures purchases from and sales to industries located in Western Australia, as well as imports from outside of Western Australia.



Figure A.1 "Trace Through" of Tourism Expenditure in an Input-Output Model

Source: ACIL Allen

The figure above depicts how expenditure from a visitor traced through a (very simple) economy:

- 1. A visitor directly spends money on tourism related products, such as airlines, cruise ships, food, beverages and accommodation.
- 2. These tourism products are then indirectly supplied in part by other companies, these companies provide goods and services that go into final product that visitors purchase. For example, a food manufacturing business as well as a catering business could provide inputs into food and beverages that a visitor purchases.

- This direct and indirect demand for goods and services requires labour, and the flow of money from visitor to business and business to business allows for wages and salaries to be paid to employees, profits to be earned and taxes to be paid to government.
- 4. In turn, results in flow-on or induced economic activity.

Results of I-O Modelling

I-O tables are able to produce results for a range of key economic indicators. For example:

- Economic Output (as measured by Gross Product);
- Industry Gross Value Added;
- Exports;
- Incomes (as measured by Wages and Salaries earned); and
- Employment (on a Full Time Equivalent (FTE) basis).

ACIL Allen's I-O modelling framework allows for results to be produced at a national, state, regional, Statistical Area Level 2 and Local Government Area level.

A.2 Tasman Global Computable General Equilibrium Model

ACIL Allen's computable general equilibrium model *Tasman Global* is a powerful tool for undertaking economic impact analysis at the regional, state, national and global level.

There are various types of economic models and modelling techniques. Many of these are based on partial equilibrium analysis that usually considers a single market. However, in economic analysis, linkages between markets and how these linkages develop and change over time can be critical. *Tasman Global* has been developed to meet this need.

Tasman Global is a large-scale computable general equilibrium model which is designed to account for all sectors within an economy and all economies across the world. ACIL Allen uses this modelling platform to undertake industry, project, scenario and policy analyses. The model is able to analyse issues at the industry, global, national, state and regional levels and to determine the impacts of various economic changes on production, consumption and trade at the macroeconomic and industry levels.

A.2.1 A Dynamic Model

Tasman Global is a model that estimates relationships between variables at different points in time. This is in contrast to comparative static models, which compare two equilibriums (one before a policy change and one following). A dynamic model such as *Tasman Global* is beneficial when analysing issues where both the timing of and the adjustment path that economies follow are relevant in the analysis.

A.2.2 The Database

A key advantage of *Tasman Global* is the level of detail in the database underpinning the model. The database we will use for this project is derived from the Global Trade Analysis Project (GTAP) database (version 8.1). This database is a fully documented, publicly available global data base which contains complete bilateral trade information, transport and protection linkages among regions for all GTAP commodities.

The GTAP model was constructed at the Centre for Global Trade Analysis at Purdue University in the United States. It is the most up-to-date, detailed database of its type in the world.

Tasman Global builds on the GTAP model's equation structure and database by adding the following important features:

- dynamics (including detailed population and labour market dynamics)
- detailed technology representation within key industries (such as electricity generation and iron and steel production)
- disaggregation of a range of major commodities including iron ore, bauxite, alumina, primary aluminium, brown coal, black coal and LNG
- the ability to repatriate labour and capital income
- a detailed emissions accounting abatement framework
- explicit representation of the states and territories of Australia
- the capacity to explicitly represent multiple regions within states and territories of Australia

Nominally the *Tasman Global* database divides the world economy into 141 regions (133 international regions plus the 8 states and territories of Australia) although in reality the regions are frequently disaggregated further. ACIL Allen regularly models Australian projects or policies at the regional level.

The *Tasman Global* database also contains a wealth of sectoral detail currently identifying up to 70 industries. The foundation of this information is the input-output tables that underpin the database. The input-output tables account for the distribution of industry production to satisfy industry and final demands. Industry demands, so-called intermediate usage, are the demands from each industry for inputs.

For example, electricity is an input into the production of communications. In other words, the communications industry uses electricity as an intermediate input. Final demands are those made by households, governments, investors and foreigners (export demand). These final demands, as the name suggests, represent the demand for finished goods and services. To continue the example, electricity is used by households – their consumption of electricity is a final demand.

Each sector in the economy is typically assumed to produce one commodity, although in *Tasman Global*, the electricity, transport and iron and steel sectors are modelled using a 'technology bundle' approach. With this approach, different known production methods are used to generate a homogeneous output for the 'technology bundle' industry. For example, electricity can be generated using brown coal, black coal, petroleum, base load gas, peak load gas, nuclear, hydro, geothermal, biomass, wind, solar or other renewable based technologies – each of which have their own cost structure.

The other key feature of the database is that the cost structure of each industry is also represented in detail. Each industry purchases intermediate inputs (from domestic and imported sources) primary factors (labour, capital, land and natural resources) as well as paying taxes or receiving subsidies.

A.2.3 Factors of Production

Capital, land, labour and natural resources are the four primary factors of production. The capital stock in each region (country or group of countries) accumulates through investment (less depreciation) in each period. Land is used only in agriculture industries and is fixed in each region. *Tasman Global* explicitly models natural resource inputs as a sector specific factor of production in resource based sectors (coal mining, oil and gas extraction, other mining, forestry and fishing).

A.2.4 Population Growth and Labour Supply

Population growth is an important determinant of economic growth through the supply of labour and the demand for final goods and services. Population growth for the 112 international regions and for the 8 states and territories of Australia represented in the Tasman Global database is projected using ACIL Allen's in-house demographic model. The demographic model projects how the

population in each region grows and how age and gender composition changes over time and is an important tool for determining the changes in regional labour supply and total population over the projection period.

For each of the 120 regions in Tasman Global, the model projects the changes in age-specific birth, mortality and net migration rates by gender for 101 age cohorts (0-99 and 100+). The demographic model also projects changes in participation rates by gender by age for each region, and, when combined with the age and gender composition of the population, endogenously projects the future supply of labour in each region. Changes in life expectancy are a function of income per person as well as assumed technical progress on lowering mortality rates for a given income (for example, reducing malaria-related mortality through better medicines, education, governance, etc.). Participation rates are a function of life expectancy as well as expected changes in higher education rates, fertility rates and changes in the workforce as a share of the total population.

	Sector		Sector
1	Paddy rice	36	Paper products, publishing
2	Wheat	37	Diesel (incl. nonconventional diesel)
3	Cereal grains nec	38	Other petroleum, coal products
4	Vegetables, fruit, nuts	39	Chemical, rubber, plastic products
5	Oil seeds	40	Iron ore
6	Sugar cane, sugar beef	41	Bauxite
7	Plant-based fibres	42	Mineral products nec
8	Crops nec	43	Ferrous metals
9	Bovine cattle, sheep, goats, horses	44	Alumina
10	Animal products nec	45	Primary aluminium
11	Raw milk	46	Metals nec
12	Wool, silk worm cocoons	47	Metal products
13	Forestry	48	Motor vehicle and parts
14	Fishing	49	Transport equipment nec
15	Brown coal	50	Electronic equipment
16	Black coal	51	Machinery and equipment nec
17	Oil	52	Manufactures nec
18	Liquified natural gas (LNG)	53	Electricity generation
19	Other natural gas	54	Electricity transmission and distribution
20	Minerals nec	55	Gas manufacture, distribution
21	Bovine meat products	56	Water
22	Meat products nec	57	Construction
23	Vegetables oils and fats	58	Trade
24	Dairy products	59	Road transport
25	Processed rice	60	Rail and pipeline transport
26	Sugar	61	Water transport
27	Food products nec	62	Air transport
28	Wine	63	Transport nec
29	Beer	64	Communication

Table A.1 Sectors in Tasman Global database

	Sector		Sector
30	Spirits and RTDs	65	Financial services nec
31	Other beverages and tobacco products	66	Insurance
32	Textiles	67	Business services nec
33	Wearing apparel	68	Recreational and other services
34	Leather products	69	Public Administration, Defence, Education, Health
35	Wood products	70	Dwellings
Source Note: n	: ACIL Allen ec = not elsewhere classified		

Labour supply is derived from the combination of the projected regional population by age by gender and the projected regional participation rates by age by gender. Over the projection period labour supply in most developed economies is projected to grow slower than total population as a result of ageing population effects. For the Australian states and territories, the projected aggregate labour supply from ACIL Allen's demographics module is used as the base level potential workforce for the detailed Australian labour market module, which is described in the next section.

A.2.5 The Australian Labour Market

Tasman Global has a detailed representation of the Australian labour market which has been designed to capture:

- different occupations
- changes to participation rates (or average hours worked) due to changes in real wages
- changes to unemployment rates due to changes in labour demand
- limited substitution between occupations by the firms demanding labour and by the individuals supplying labour
- limited labour mobility between states and regions within each state.

Tasman Global recognises 97 different occupations within Australia – although the exact number of occupations depends on the aggregation. The firms who hire labour are provided with some limited scope to change between these 97 labour types as the relative real wage between them changes. Similarly, the individuals supplying labour have a limited ability to change occupations in response to the changing relative real wage between occupations. Finally, as the real wage for a given occupation rises in one state relative to other states, workers are given some ability to respond by shifting their location. The model produces results at the 97 3-digit ANZSCO (Australian New Zealand Standard Classification of Occupations) level.

The labour market structure of *Tasman Global* is thus designed to capture the reality of labour markets in Australia, where supply and demand at the occupational level do adjust, but within limits.

Labour supply in Tasman Global is presented as a three stage process:

- labour makes itself available to the workforce based on movements in the real wage and the unemployment rate;
- labour chooses between occupations in a state based on relative real wages within the state; and
- labour of a given occupation chooses in which state to locate based on movements in the relative real wage for that occupation between states.

By default, *Tasman Global*, like all CGE models, assumes that markets clear. Therefore, overall, supply and demand for different occupations will equate (as is the case in other markets in the model).



ACIL Allen has presented in the summary tables below the full set of I-O economic contribution modelling results by education sub-sector, by source market and by industry.

B.1 Economic Contribution by Education Sub-sector

Education sub- sector	Direct contribution	Indirect contribution	Total	Contribution per student
Value added				
Higher education	\$317.2m	\$755.5m	\$1072.7m	\$61,439
VET	\$36.6m	\$166.3m	\$203m	\$25,746
Schools	\$12.1m	\$31.2m	\$43.3m	\$67,146
ELICOS	\$3.5m	\$12.2m	\$15.7m	\$11,748
Non-award	\$3.6m	\$5.7m	\$9.4m	\$28,526
Total	\$373m	\$971.1m	\$1344m	\$48,608
Employment (FTE)			
Higher education	2204.3	3794.5	5998.8	0.34
VET	254.4	797.8	1052.3	0.13
Schools	156.4	153.4	309.7	0.48
ELICOS	60.9	58.9	119.8	0.09
Non-award	25.1	30.2	55.3	0.17
Total	2701.1	4834.8	7535.9	0.27

 Table B.1
 Economic Contribution from International Students by Education Sub-sector

B.2 Economic Contribution by Source Market

 Table B.2
 Economic Contribution from International Students by Source Market

Source Market	Direct contribution	Indirect contribution	Total	Contribution per student
Value added				
India	\$66.4m	\$188.1m	\$254.5m	\$49,141
China	\$70.3m	\$146.2m	\$216.5m	\$50,274
Malaysia	\$24.4m	\$61.5m	\$85.9m	\$54,053
Brazil	\$5.1m	\$17.8m	\$22.9m	\$29,838

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Source Market	Direct contribution	Indirect contribution	Total	Contribution per student
Bhutan	\$20.2m	\$56.2m	\$76.4m	\$53,446
Nepal	\$16.7m	\$47.3m	\$64m	\$50,501
Pakistan	\$15.8m	\$43.2m	\$59m	\$51,899
Colombia	\$4.5m	\$15.2m	\$19.7m	\$28,164
Vietnam	\$13.1m	\$36.1m	\$49.1m	\$54,108
Singapore	\$18.7m	\$40.7m	\$59.4m	\$55,490
Taiwan	\$3m	\$9.5m	\$12.5m	\$31,634
Hong Kong	\$12.7m	\$31.3m	\$44m	\$52,710
Kenya	\$8.8m	\$24.3m	\$33.1m	\$53,646
Indonesia	\$10.2m	\$26.1m	\$36.3m	\$52,470
Philippines	\$7m	\$22.8m	\$29.8m	\$37,576
Japan	\$2.4m	\$6.9m	\$9.3m	\$34,456
South Korea	\$4.3m	\$12.8m	\$17.1m	\$38,138
All Others	\$69.4m	\$185.1m	\$254.6m	\$48,503
Total	\$373m	\$971.1m	\$1344m	\$48,608
Employment (FTE)				
India	481	926	1406.9	0.27
China	509.1	748.1	1257.2	0.29
Malaysia	176.7	309.2	485.9	0.31
Brazil	36.7	86.3	123	0.16
Bhutan	146.4	277.2	423.6	0.30
Nepal	121	233	354	0.28
Pakistan	114.2	213.2	327.4	0.29
Colombia	32.6	73.6	106.2	0.15
Vietnam	94.7	177.9	272.6	0.30
Singapore	135.3	207.6	342.9	0.32
Taiwan	21.6	47.2	68.7	0.17
Hong Kong	92	157.5	249.5	0.30
Kenya	63.8	119.9	183.6	0.30
Indonesia	73.8	129.5	203.3	0.29
Philippines	50.7	110.8	161.6	0.20
Japan	17.4	34.4	51.7	0.19
South Korea	31.1	63.7	94.8	0.21
All Others	502.9	920	1422.9	0.27
Total	2701.1	4834.8	7535.9	0.27

B.3 Economic Contribution by Industry

Table B.3 Economic Contribution from International Students by Industry

Key Sector	Direct contribution	Indirect contribution	Total
Value added			
Agriculture, forestry and fishing	-	\$27.8m	\$27.8m
Mining	-	\$10.3m	\$10.3m
Manufacturing	-	\$45.2m	\$45.2m
Electricity, gas, water and waste services	-	\$20.6m	\$20.6m
Construction	-	\$19.7m	\$19.7m
Wholesale trade	-	\$41.1m	\$41.1m
Retail trade	-	\$136.8	\$136.8
Accommodation and food services	-	\$50.3m	\$50.3m
Transport, postal and warehousing	-	\$65.4m	\$65.4m
Information media and telecommunications	-	\$25.1m	\$25.1m
Financial and insurance services	-	\$58.7m	\$58.7m
Rental, hiring and real estate services	-	\$280.8m	\$280.8m
Professional, scientific and technical services	-	\$40.3m	\$40.3m
Administrative and support services	-	\$54.2m	\$54.2m
Public administration and safety	-	\$7.6m	\$7.6m
Education and training	\$373m	\$22.4m	\$395.4m
Health care and social assistance	-	\$31.1m	\$31.1m
Arts and recreation services	-	\$9.2m	\$9.2m
Other services	-	\$24.3m	\$24.3m
Total	\$373m	\$971.1m	\$1344m
Employment (FTE)			
Agriculture, forestry and fishing	-	152.5	152.5
Mining	-	14	14
Manufacturing	-	307	307
Electricity, gas, water and waste services	-	72.6	72.6
Construction	-	125.1	125.1
Wholesale trade	-	174.5	174.5
Retail trade	-	950.4	950.4
Accommodation and food services	-	832.2	832.2
Transport, postal and warehousing	-	314.8	314.8
Information media and telecommunications	-	84.2	84.2
Financial and insurance services		133.1	133.1
Rental, hiring and real estate services	-	113	113

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Key Sector	Direct contribution	Indirect contribution	Total
Professional, scientific and technical services	-	254.1	254.1
Administrative and support services	-	238.3	238.3
Public administration and safety	-	82.9	82.9
Education and training	2701.1	249.6	2950.7
Health care and social assistance	-	257	257
Arts and recreation services	-	170.9	170.9
Other services	-	308.7	308.7
Total	2701.1	4834.8	7535.9

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